REMARKS

Claims 1 through 32 are pending in this application. Claims 25-28 are withdrawn. Claims 6, 7, 9-18, 22, 24, 26, and 28-32 are amended herein. Support for the amendments to the claims may be found in the claims as originally filed. Reconsideration is requested based on the foregoing amendment and the following remarks.

Acknowledgement:

The Applicants appreciate acknowledgement of receipt of their response to the restriction requirement. The withdrawn claims that aren't being amended herein have been designated "withdrawn" accordingly. The Applicants would prefer to not cancel the withdrawn claims at this time, however, since their rejoinder and consideration is still possible.

Objections to the Specification:

The Title of the Invention was objected to as not being descriptive. The Title has been replaced with a new Title in substantial accord with the Examiner's suggestion. The Applicants appreciate the Examiner's suggestion. Withdrawal of the objection is earnestly solicited.

Objections to the Claims:

Claims 6-23 were objected to for various informalities. Claims 6, 7, 9-18, and 22 have been amended in substantial accord with the Examiner's suggestions. The Applicants appreciate the Examiner's suggestions. Support for the recitation of claims 11, 12, and 13, in particular, may be found, inter alia at page 3, lines 7-10 of the specification as filed originally. Withdrawal of the objection is earnestly solicited.

Claim Rejections - 35 U.S.C. § 102:

Claims 1-6, 29, 30, and 32 were rejected under 35 U.S.C. § 102(e) as anticipated by Alpert et al., US 6,401,234 (hereinafter "Alpert"). The rejection is traversed to the extent it would apply to the claims as amended.

The claimed invention is described in at least three embodiments. In a first embodiment, a search is carried out on each route from a starting point pin to an end point pin for a route that

is distinguished from others by a set condition. In a second embodiment, a search is carried out for a route from a starting point pin to an end point pin which satisfies a set condition. In a third embodiment, a search is carried out that synthesizes a route from a starting point pin to an end point pin which satisfies a set condition.

The condition referred to above may be set as, for example, "routes that connect a starting point and an ending point of an electronic circuit and that pass through any specified points in any specified order." It is possible, furthermore, to single out one route of each class of routes by distinguishing respective routes from each other by determining whether they comply with each of the set conditions. In any of the three embodiments, one or more routes are extracted from routes connecting the same starting and ending point. As a practical matter, two or more routes are normally extracted because routes are distinguished with respect to conditions, as described at page 29, line 6-9 of the specification, and as shown in Fig. 7.

Alpert is concerned with a value of a kind associated with each two-path and describes searching for two-paths of which the value of concern is the smallest among various two-paths, as described at column 3, lines 62 et seq. According to Alpert, only one route is selected from the plurality of routes joining at a point. Alpert thus selects only one route and is not, therefore, concerned with a route search conducted on the basis of conditions in the manner of the claimed invention.

Claim 1, in particular, recites:

"distinguishing a route from others depending on whether or not the route satisfies the set condition."

Alpert neither teaches, discloses, nor suggests distinguishing a route from others depending on whether or not the route satisfies a *set* condition, as recited in claim 1. In Alpert, rather, "a two-path having a high cost is subsequently selected and re-routed with a lower cost two-path," as described at column 2, lines 4 and 5. Since Alpert selects the two-path having the highest cost for re-routing, there is no *set* condition in Alpert for selecting a two-path. Rather, in Alpert, each two-path is compared with another two-path, and thus the selection "condition" varies continuously. This is to be contrasted with claim 1, in which a route is distinguished from others depending on whether or not the route satisfies a set condition.

Furthermore, as described in Alpert at column 3, lines 18-26,

"The Steiner tree re-routing algorithm then chooses a poorly routed two-path and removes the poorly routed two-path, as shown in block 43. The two-path with the highest cost value may not necessarily be the most poorly routed path because

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the highest cost value path can simply be a very long path."

Since Alpert chooses a poorly routed two-path for removal, and the two-path with the highest cost value may not necessarily be the most poorly routed path, there is no *set* condition in Alpert for choosing a two-path. This is to be contrasted with claim 1, in which a route is distinguished from others depending on whether or not the route satisfies a *set* condition.

Finally, as described in Alpert at column 3, lines 30, 31, and 32,

"This choice is equivalent to choosing a two-path with the highest ratio of interconnect length routed over blockage(s) to total interconnect length."

Since Alpert chooses the two-path with the highest *ratio* of interconnect length routed over blockage(s) to total interconnect length, there is no *set* condition in Alpert for choosing a two-path. This is to be contrasted with claim 1, in which a route is distinguished from others depending on whether or not the route satisfies a *set* condition. Claim 1 is submitted to be allowable. Withdrawal of the rejection of claim 1 is earnestly solicited.

Claims 2-5 depend from claim 1 and add further distinguishing elements. Claims 2-5 are thus also submitted to be allowable. Withdrawal of the rejection of claims 2-5 is also earnestly solicited.

Claim 6 recites, in pertinent part:

"setting aside only one of the at least two routes satisfying the at least <u>one</u> condition."

Alpert neither teaches, discloses, nor suggests setting aside only one of the at least two routes satisfying the at least one condition, as recited in claim 6. In Alpert, rather, each higher cost two-path is selected and re-routed with a lower cost two-path, as discussed above with respect to the rejection of claim 1. Since Alpert selects the higher cost two-path for re-routing, Alpert sets aside no route satisfying at least *one* condition. Claim 6 is thus also submitted to be allowable for at least those reasons discussed above with respect to the rejection of claim 1. Withdrawal of the rejection of claim 6 is earnestly solicited.

Claim 29 recites, in pertinent part:

"distinguishing a route from others depending on whether or not the route satisfies the at least <u>one</u> condition."

Alpert neither teaches, discloses, nor suggests distinguishing a route from others depending on whether or not the route satisfies the at least *one* condition, as recited in claim 29. In Alpert, rather, each higher cost two-path is selected and re-routed with a lower cost two-path,

as discussed above with respect to the rejection of claim 1. Since Alpert selects the higher cost two-path for re-routing, Alpert distinguishes no route satisfying at least *one* condition from others. Claim 29 is thus also submitted to be allowable for at least those reasons discussed above with respect to the rejection of claim 1. Withdrawal of the rejection of claim 29 is earnestly solicited.

Claim 30 recites, in pertinent part:

"setting aside only one of the at least routes satisfying the at least <u>one</u> condition."

Alpert neither teaches, discloses, nor suggests setting aside only one of the at least routes satisfying the at least *one* condition, as recited in claim 30. In Alpert, rather, each higher cost two-path is selected and re-routed with a lower cost two-path, as discussed above with respect to the rejection of claim 1. Since Alpert selects the higher cost two-path for re-routing, Alpert sets aside no route satisfying at least *one* condition. Claim 30 is thus also submitted to be allowable for at least those reasons discussed above with respect to the rejection of claim 1. Withdrawal of the rejection of claim 30 is earnestly solicited.

Claim 32 recites, in pertinent part:

"distinguishing a route from others depending on whether or not the route satisfies the at least <u>one</u> condition."

Alpert neither teaches, discloses, nor suggests distinguishing a route from others depending on whether or not the route satisfies the at least *one* condition, as recited in claim 32. In Alpert, rather, each higher cost two-path is selected and re-routed with a lower cost two-path, as discussed above with respect to the rejection of claim 1. Since Alpert selects the higher cost two-path for re-routing, Alpert distinguishes no route satisfying at least *one* condition from others. Claim 32 is thus also submitted to be allowable for at least those reasons discussed above with respect to the rejection of claim 1. Withdrawal of the rejection of claim 32 is earnestly solicited.

Claim Rejections - 35 U.S.C. § 103:

Claim 7 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Alpert in view of Kaneko, US 6,308,306 (hereinafter "Kaneko"). The rejection is traversed. Reconsideration is earnestly solicited.

Kaneko calculates a delay time from every starting point when a signal reaches an end

point. Only the worst delay time, however, is calculated for each starting point. Neither the maximum-minimum recited in claim 7 nor the at least one condition is anticipated by Kaneko.

In particular, claim 7 depends from claim 6 and adds further distinguishing elements. Alpert neither teaches, discloses, nor suggests setting aside only one of the at least two routes satisfying the at least one condition, as discussed above with respect to claim 6. Kaneko mentions no condition at all, and thus cannot make up for the deficiencies of Alpert with respect to claim 7.

Furthermore, the Office Action provides no motivation or suggestion to combine the teachings of Alpert in view of Kaneko as required by 35 U.S.C. § 103(a) and the M.P.E.P. §706.02(j)(D), beyond the assertion that "being able to select route with longest and shortest delay time from a plurality of routes is very important in the optimization of IC designs in terms of performance and area."

Alpert, however, which is the primary reference, is actually concerned with selecting a two-path having a high cost and re-routing it with a lower cost two-path, as described at column 2, lines 4 and 5. Delay is not cost. Alpert is complete in itself. There is no teaching or suggestion anywhere in Alpert upon which persons of ordinary skill in the art would have relied to deviate from the focus of Alpert in the manner suggested in the Office Action.

Furthermore, Alpert teaches away from the modification proposed in the Office Action at column 1, lines 21 and 22, where he notes that, "If this trend continues, interconnect delay will become more dominant than logic delay in the near future." Alpert is thus more concerned with *balancing* interconnect delay with logic delay than he is with selecting the routes with the longest and the shortest delay time from a plurality of routes. The modification proposed in the Office Action would not help Alpert at all, since selecting a route with longest or the shortest delay time simply exacerbates the disparity in delay times, which Alpert is trying to address. Claim 7 is thus submitted to be allowable. Withdrawal of the rejection of claim 7 is earnestly solicited.

Rejection of Claims 8, 16, 24, and 31:

Claims 8, 16, 24, and 31 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Alpert in view of Doreswamy et al. US 5,784,600 (hereinafter "Doreswamy"). The rejection is traversed. Reconsideration is earnestly solicited.

Doreswamy adjusts the length of a wire to reduce the skew between two signals. The route, therefore, is set in advance. No route search subject to a set condition is performed in Doreswamy.

In the claimed invention, in contrast to the cited references, it is possible to distinguish routes by defining conditions. A route may be chosen such that a signal meets a certain condition when it passes through a specific point on a circuit, such as a false-path or a multi-cycle path. In this case, the points are often set at positions defined freely on the electronic circuit. As a result, it is often impossible to distinguish a specific route by the associated starting an ending points. Thus the techniques of the cited references may not be employed.

A route may also be distinguished for each clock signal in a flip-flop which inputs different clock signals. It may therefore be necessary to distinguish routes with respect to them that include a cell that can either modify or generate a clock signal. A cell with this kind of capability may be found at a point other than the starting or the ending point. Thus the techniques of the cited references may not be employed for this case, either.

Claim 8, in particular, depends from claim 6 and adds further distinguishing elements. Alpert neither teaches, discloses, nor suggests setting aside only one of the at least two routes satisfying the at least one condition, as discussed above with respect to claim 6. Doreswamy mentions no condition at all, and thus cannot make up for the deficiencies of Alpert with respect to claim 8. Claim 8 is thus submitted to be allowable. Withdrawal of the rejection of claim 8 is earnestly solicited.

Claim 16 recites, in pertinent part:

"setting at least one condition to be satisfied among the at least two routes."

Alpert neither teaches, discloses, nor suggests setting at least one condition to be satisfied among the at least two routes, as recited in claim 16. In Alpert, rather, each higher cost two-path is selected and re-routed with a lower cost two-path, as discussed above with respect to the rejection of claim 1. Since Alpert selects the higher cost two-path for re-routing, Alpert sets no condition to be satisfied among the two routes. Doreswamy mentions no condition at all, and thus cannot make up for the deficiencies of Alpert with respect to the rejection of claim 16. Claim 16 is thus submitted to be allowable. Withdrawal of the rejection of claim 16 is earnestly solicited.

Claim 24 recites, in pertinent part:

"setting at least one condition to be satisfied among the at least two routes."

Alpert neither teaches, discloses, nor suggests setting at least one condition to be satisfied among the at least two routes, as recited in claim 24. In Alpert, rather, each higher cost two-path is selected and re-routed with a lower cost two-path, as discussed above with respect

to the rejection of claim 1. Since Alpert selects the higher cost two-path for re-routing, Alpert sets no condition to be satisfied among the two routes. Doreswamy mentions no condition at all, and thus cannot make up for the deficiencies of Alpert with respect to claim 24. Claim 24 is thus submitted to be allowable. Withdrawal of the rejection of claim 24 is earnestly solicited.

Claim 31 recites, in pertinent part:

"setting at least one condition to be satisfied among the at least two routes."

Alpert neither teaches, discloses, nor suggests setting at least one condition to be satisfied among the at least two routes., as recited in claim 31. In Alpert, rather, each higher cost two-path is selected and re-routed with a lower cost two-path, as discussed above with respect to the rejection of claim 1. Since Alpert selects the higher cost two-path for re-routing, Alpert sets no condition to be satisfied among the two routes. Doreswamy mentions no condition at all, and thus cannot make up for the deficiencies of Alpert with respect to claim 31. Claim 31 is thus submitted to be allowable. Withdrawal of the rejection of claim 31 is earnestly solicited.

Allowable Subject Matter:

The Applicant acknowledges with appreciation the indication that claims 9-15 and 17-23 contain allowable subject matter.

Conclusion:

There being no further outstanding objections or rejections, it is submitted that the application is in condition for allowance. An early action to that effect is courteously solicited.

Finally, if there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned to attend to these matters.

If there are any additional fees associated with filing of this Amendment, please charge the same to our Deposit Account No. 19-3935.

Respectfully submitted,

STAAS & HALSEY LLP

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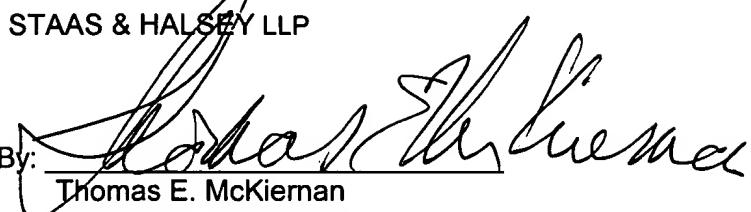
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